

Soil Particle Density

Lab Guide

Task

To measure the particle density of a soil sample

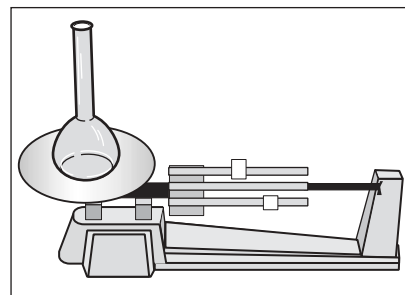
What You Need

- ☐ Oven-dried, sieved soil
- ☐ Distilled water
- ☐ Small funnel
- ☐ Balance accurate to 0.1 g
- ☐ Squirt bottle
- ☐ Oven mitts or tongs
- ☐ Three 100 ml volumetric or Erlenmeyer flasks with caps or stoppers
- ☐ Pencil or pen
- ☐ Thermometer
- ☐ Squirt bottle for washing soil out of beaker
- ☐ Hot plate or Bunsen burner or other heat source
- ☐ *Soil Particle Density Data Sheet*

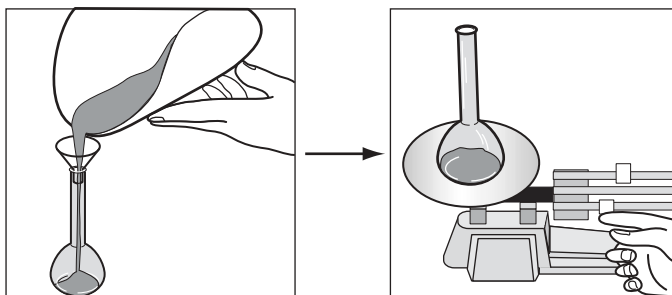
In the Lab

1. Place distilled water in squirt bottle.

2. Measure the mass of the empty flask without its cap.
Record the mass on the *Soil Particle Density Data Sheet*.



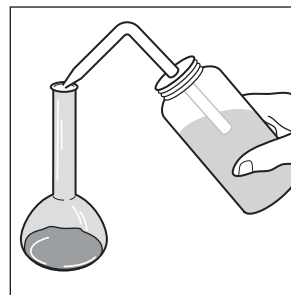
3. Measure 25 g of dried, sieved soil. Place soil in the flask using the funnel. Since it is important to have all 25 g of soil in the flask, be careful to transfer all the soil into the flask and not to spill any soil outside the flask (**Note:** if soil is spilled outside the flask, do this step over with another 25 g sample).



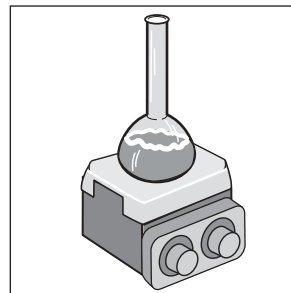
4. Record the length of time since the soil was dried in an oven, and how the soil has been stored (e.g. in plastic bag, air tight container, other).

5. Measure the mass of the flask containing the soil (without the stopper/cap). Record the mass on the *Soil Particle Density Data Sheet*.

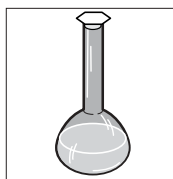
6. Use the squirt bottle to wash any soil sticking to the neck of the flask down to the bottom of the flask. Add about 50 ml of distilled water to the soil in the flask.



7. Bring the soil/water mixture to a gentle boil by placing the flask on a hot plate or holding it over a Bunsen burner. Gently swirl the flask for 10 seconds once every minute to keep the soil/water mixture from foaming over. Boil for 10 minutes to remove air bubbles.

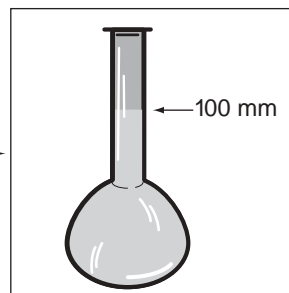
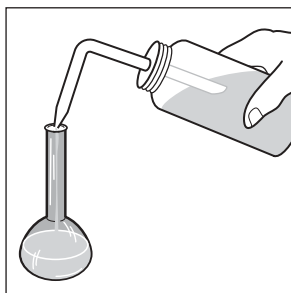


8. Remove the flask from the heat and allow the mixture to cool.

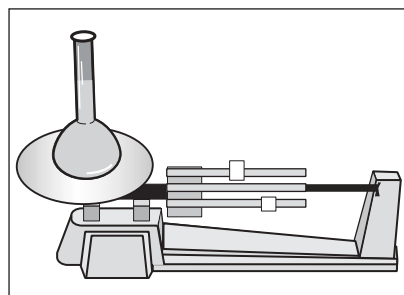


9. Once the flask has cooled, cap the flask and let it sit for 24 hours.

10. After 24 hours, remove the stopper/cap and fill the flask with distilled water so that the bottom of the meniscus is at the 100 mL line.



11. Weigh the 100 mL-soil/water mixture in the flask (without the stopper/cap). Record the mass of the mixture on the *Soil Particle Density Data Sheet*.



12. Place the bulb of the thermometer in the flask for 2-3 minutes. When the temperature has stabilized, record the temperature of the mixture on the *Soil Particle Density Data Sheet*.

